

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An alkaline protease, comprising the amino acid sequence of SEQ ID NO: 1 wherein one or more amino acid residues selected from the group consisting of (a) position 84, (b) position 104, (c) position 256 or (d) position 369 of SEQ ID NO:1 has been specifically mutated to replace the original amino acid with an amino acid as follows:

at position (a): an arginine residue;

at position (b): a proline residue;

at position (c): an alanine, serine, glutamine, valine, leucine, asparagine, glutamic acid or aspartic acid residue, and

at position (d): an asparagine residue

(a) K84 is replaced with R;

(b) L104 is replaced with P;

(c) M256 is replaced with an amino acid selected from the group consisting of A, S, Q, V, L, N, E, and D; and

(d) D369 is replaced with N.

2. (Currently Amended) An alkaline protease, comprising an amino acid sequence having at least 80% 95% homology to the amino acid sequence represented by SEQ ID NO:1, wherein one or more amino acid residues selected from the group consisting of (a) position 84, (b) position 104, (c) position 256 or (d) position 369 of SEQ ID NO:1 has been specifically mutated to replace the original amino acid with an amino acid as follows:

at position (a): an arginine residue;

at position (b): a proline residue;

at position (c): an alanine, serine, glutamine, valine, leucine, asparagine, glutamic acid or aspartic acid residue, and

at position (d): an asparagine residue

(a) K84 is replaced with R;

(b) L104 is replaced with P;

(c) M256 is replaced with an amino acid selected from the group consisting of A, S,

Q, V, L, N, E, and D; and

(d) D369 is replaced with N,

wherein said alkaline protease has oxidant resistance, is active at an alkaline pH, and retains at least 80% residual activity when treated at pH 10 for 10 minutes.

3. (Withdrawn; Currently Amended) An alkaline protease, comprising the amino acid sequence of SEQ ID NO: 1 wherein one or more ~~an~~ amino acid residue at residues selected from the group consisting of (e) position 66 or 264, (f) position 57, each of 101 to 106, 136, 193 or 342, (g) position 46 or 205, (h) position 54, 119, 138, 148 or 195, (i) position 247, (j) position 124, (k) position 107 or (l) position 257 of SEQ ID NO:1, or at a position corresponding thereto has been deleted or selected from:

at position (e): a glutamine, aspartic acid, serine, glutamic acid, alanine, threonine, leucine, methionine, cysteine, valine, glycine or isoleucine residue

at position (f): a lysine, serine, glutamine, phenylalanine, valine, arginine, tyrosine, leucine, isoleucine, threonine, methionine, cysteine, tryptophan, aspartic acid, glutamic acid, histidine, proline or alanine residue,

at position (g): a tyrosine, tryptophan, alanine, asparagine, glutamic acid, threonine, valine, leucine, isoleucine, histidine, serine, lysine, glutamine, methionine or cysteine residue,

at position (h): a tryptophan, phenylalanine, alanine, asparagine, glutamic acid, threonine, valine, histidine, serine, lysine, glutamine, methionine, glycine, aspartic acid, proline, arginine or cysteine residue,

~~at position (i): a tryptophan, phenylalanine, alanine, asparagine, glutamic acid, threonine, valine, leucine, isoleucine, histidine, serine, glutamine, methionine or cysteine residue,~~

~~at position (j): an alanine or lysine residue,~~

~~at position (k): a lysine, arginine, alanine or serine residue, and~~

~~at position (l): a valine or isoleucine residue~~

(a) N66 is replaced with an amino acid selected from the group consisting of Q, D, S, E, A, T, L, M, C, V, G, and I;

(b) N264 is replaced with an amino acid selected from the group consisting of Q, D, S, E, A, T, L, M, C, V, G, and I;

(c) G57 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(d) G101 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(e) G102 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(f) G103 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(g) L104 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, I, T, M, C, W, D, E, H, P, and A;

(h) G105 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(i) G106 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(j) G136 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(k) G193 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(l) G342 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(m) F46 is replaced with an amino acid selected from the group consisting of Y, W, A, N, E, T, V, L, I, H, S, K, Q, M, and C;

(n) F205 is replaced with an amino acid selected from the group consisting of Y, W, A, N, E, T, V, L, I, H, S, K, Q, M, and C;

(o) Y54 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(p) Y119 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(q) Y138 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(r) Y148 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(s) Y195 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(t) K247 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, L, I, H, S, Q, M, and C;

(u) R124 is replaced with an amino acid selected from the group consisting of A and K;

(v) L107 is replaced with an amino acid selected from the group consisting of K, R, A, and S; and

(w) A257 is replaced with an amino acid selected from the group consisting of V and I.

4. (Withdrawn; Currently Amended) An alkaline protease, comprising an amino acid sequence having at least 95% homology to the amino acid sequence represented by SEQ ID NO:1 or having an amino acid sequence showing at least 60% homology therewith, wherein one or more an amino acid residue at residues selected from the group consisting of (e) position 66 or 264, (f) position 57, each of 101 to 106, 136, 193 or 342, (g) position 46 or 205, (h) position 54, 119, 138, 148 or 195, (i) position 247, (j) position 124, (k) position 107 or (l) position 257 of SEQ ID NO:1, or at a position corresponding thereto has been deleted or selected from:

at position (e): a glutamine, aspartic acid, serine, glutamic acid, alanine, threonine, leucine, methionine, cysteine, valine, glycine or isoleucine residue

at position (f): a lysine, serine, glutamine, phenylalanine, valine, arginine, tyrosine, leucine, isoleucine, threonine, methionine, cysteine, tryptophan, aspartic acid, glutamic acid, histidine, proline or alanine residue,

at position (g): a tyrosine, tryptophan, alanine, asparagine, glutamic acid, threonine, valine, leucine, isoleucine, histidine, serine, lysine, glutamine, methionine or cysteine residue,

at position (h): a tryptophan, phenylalanine, alanine, asparagine, glutamic acid, threonine, valine, histidine, serine, lysine, glutamine, methionine, glycine, aspartic acid, proline, arginine or cysteine residue,

~~at position (i): a tryptophan, phenylalanine, alanine, asparagine, glutamic acid, threonine, valine, leucine, isoleucine, histidine, serine, glutamine, methionine or cysteine residue,~~

~~at position (j): an alanine or lysine residue;~~

~~at position (k): a lysine, arginine, alanine or serine residue, and~~

~~at position (l): a valine or isoleucine residue~~

(a) N66 is replaced with an amino acid selected from the group consisting of Q, D, S, E, A, T, L, M, C, V, G, and I;

(b) N264 is replaced with an amino acid selected from the group consisting of Q, D, S, E, A, T, L, M, C, V, G, and I;

(c) G57 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(d) G101 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(e) G102 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(f) G103 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(g) L104 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, I, T, M, C, W, D, E, H, P, and A;

(h) G105 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(i) G106 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(j) G136 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(k) G193 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(l) G342 is replaced with an amino acid selected from the group consisting of K, S, Q, F, V, R, Y, L, I, T, M, C, W, D, E, H, P, and A;

(m) F46 is replaced with an amino acid selected from the group consisting of Y, W, A, N, E, T, V, L, I, H, S, K, Q, M, and C;

(n) F205 is replaced with an amino acid selected from the group consisting of Y, W, A, N, E, T, V, L, I, H, S, K, Q, M, and C;

(o) Y54 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(p) Y119 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(q) Y138 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(r) Y148 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(s) Y195 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, H, S, K, Q, M, G, D, P, R, and C;

(t) K247 is replaced with an amino acid selected from the group consisting of W, F, A, N, E, T, V, L, I, H, S, Q, M, and C;

(u) R124 is replaced with an amino acid selected from the group consisting of A and K;

(v) L107 is replaced with an amino acid selected from the group consisting of K, R, A, and S; and

(w) A257 is replaced with an amino acid selected from the group consisting of V and I.

5. – 9. (Canceled)

10. (Withdrawn) A detergent composition, comprising the alkaline protease according to Claim 1.

11. – 14. (Canceled)

15. (Previously Presented) A detergent composition comprising the alkaline protease according to Claim 2.

16. – 19. (Canceled)

20. (Withdrawn) A detergent composition comprising the alkaline protease according to Claim 3.

21. – 30. (Canceled)

31. (Withdrawn) A detergent composition comprising the alkaline protease according to Claim 4.

32. – 36. (Canceled)

37. (Currently Amended) The alkaline protease according to Claim 1, wherein (d) ~~position 369 of SEQ ID NO:1 has been specifically mutated to replace the original amino acid with an asparagine residue D369 is replaced with N.~~

38. (Currently Amended) The alkaline protease according to Claim 37, wherein one or more amino acid residues selected from the group consisting of (a) ~~position 84, (b) position 104, and (c) position 256 or at a position corresponding thereto has been specifically mutated to replace the original amino acid with an amino acid as follows:~~

~~at position (a): an arginine residue,~~
~~at position (b): a proline residue,~~
~~at position (c): an alanine, serine, glutamine, valine, leucine, asparagine, glutamic acid or aspartic acid residue~~

(a) K84 is replaced with R;

(b) L104 is replaced with P; and

(c) M256 is replaced with an amino acid selected from the group consisting of A, S, Q, V, L, N, E, and D.

39. (Currently Amended) The alkaline protease according to Claim 2, wherein ~~(d) position 369 of SEQ ID NO:1 has been specifically mutated to replace the original amino acid with an asparagine residue~~ D369 is replaced with N.

40. (Currently Amended) The alkaline protease according to Claim 39, wherein one or more amino acid residues selected from the group consisting of ~~(a) position 84, (b) position 104, and (c) position 256 or at a position corresponding thereto has been specifically mutated to replace the original amino acid with an amino acid as follows:~~

~~at position (a): an arginine residue,~~
~~at position (b): a proline residue,~~
~~at position (c): an alanine, serine, glutamine, valine, leucine, asparagine, glutamic acid or aspartic acid residue~~

(a) K84 is replaced with R;
(b) L104 is replaced with P; and
(c) M256 is replaced with an amino acid selected from the group consisting of A, S, Q, V, L, N, E, and D.

SUPPORT FOR THE AMENDMENT

Claims 1-4 and 37-40 have been amended.

Claims 5-9, 11-14, 16-19, 21-30, and 32-36 have been canceled.

The amendment of Claims 1-4 and 37-40 is supported by the corresponding claims as originally filed and pages 5-31 as originally filed, including: page 8, lines 1-4, page 9, lines 11-13, page 10, lines 20-23, and Table 2 on page 30.

No new matter has been entered by the present amendment.